

General

Title

Adult trauma care: percentage of discharges of patients age 18 years and older with a primary injury diagnosis and one of the following secondary diagnoses: decubitus ulcer, hospital acquired infection, iatrogenic pneumothorax, foreign body left during procedure, myocardial infarction, acute renal failure.

Source(s)

Guide to quality indicators in adult trauma care. Version 3. Calgary (AB): Quality of Trauma in Adult Care, University of Calgary; 2013 Jan 29. 129 p. [111 references]

Measure Domain

Primary Measure Domain

Clinical Quality Measures: Outcome

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the percentage of discharges of patients age 18 years and older with a primary injury diagnosis AND one of the following secondary diagnoses:

- Decubitus ulcer
- Hospital acquired infection (any – pneumonia, blood stream, wound, etc.)
- Iatrogenic pneumothorax
- Foreign body left during procedure
- Myocardial infarction
- Acute renal failure

(per 100 patient discharges)

Rationale

Each year, injuries affect 700 million people worldwide and result in more than five million deaths. In many countries, injuries are the leading cause of death among those under the age of 45 years. The human and societal burden is even greater with many survivors never returning to school, work or their "regular" lives.

Health care services provide patients with treatment for what is a major cause of morbidity and death. Yet medical errors and substandard care threaten trauma care. Half of all patients with major traumatic injuries do not receive recommended care, medical errors are common in critically ill trauma patients and preventable trauma deaths in hospital are widely reported. The World Health Organization (WHO), professional trauma organizations (e.g., American College of Surgeons [ACS], Trauma Association of Canada and Royal Australasian College of Surgeons) and accreditation bodies have promoted efforts to improve the quality of care delivered to injured patients. However, before the quality of injury care can be improved, it needs to be measured using reliable and valid measures of health care quality.

These indicators can be used to assess patient safety, and to evaluate and improve quality of care by incorporating these measures into local, regional or national quality improvement efforts. Implementing a consistent approach to measurement (same indicators, same definitions, same data elements, same reporting format) would provide institutions with reliable performance data that is necessary for surveillance (e.g., tertiary survey completion), to track local problems (e.g., adverse events – specifically missed injuries), evaluate the effects of interventions or program changes (e.g., tertiary survey protocol) and provide comparisons across centers (e.g., benchmarking adverse events using programs such as the ACS's Trauma Quality Improvement Program). Well-designed, carefully evaluated and appropriately implemented quality indicators (QIs) may be essential tools for guiding efforts to improve health and healthcare.

This indicator is intended to monitor adverse events among hospitalized patients.

Evidence for Rationale

Guide to quality indicators in adult trauma care. Version 3. Calgary (AB): Quality of Trauma in Adult Care, University of Calgary; 2013 Jan 29. 129 p. [111 references]

Primary Health Components

Trauma care; injury; adverse event; decubitus ulcer; hospital acquired infection; iatrogenic pneumothorax; foreign body left during procedure; myocardial infarction; acute renal failure

Denominator Description

All discharges of patients age 18 years and older with a primary injury diagnosis

Numerator Description

All discharges of patients age 18 years and older with a primary injury diagnosis AND one of the following secondary diagnoses:

- Decubitus ulcer
- Hospital acquired infection (any – pneumonia, blood stream, wound, etc.)
- Iatrogenic pneumothorax
- Foreign body left during procedure
- Myocardial infarction
- Acute renal failure

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Additional Information Supporting Need for the Measure

Four studies demonstrated an association between the quality indicator and hospital mortality (Copes et al., 1995; Miller et al., 2006; Nayduch et al., 1994; Willis, Stoelwinder, & Cameron, 2008). Two studies demonstrated no association between the quality indicator and hospital mortality (Al-Naami, Al-Faki, & Sadik, 2003; Schwartz et al., 1991). Two studies demonstrated that implementation of a trauma quality improvement program that included the quality indicator was associated with reduced hospital mortality (Chadbunchachai et al., 2001; Chadbunchachai et al., 2003). One study demonstrated an association between the quality indicator and length of stay (Shafi et al., 2010).

Evidence for Additional Information Supporting Need for the Measure

Al-Naami MY, Al-Faki AA, Sadik AA. Quality improvement data analysis of a mass casualty event. *Injury*. 2003 Nov;34(11):857-61. [PubMed](#)

Chadbunchachai W, Saranrittichai S, Sriwiwat S, Chumsri J, Kulleab S, Jaikwang P. Study on performance following Key Performance Indicators for trauma care: Khon Kaen Hospital 2000. *J Med Assoc Thai*. 2003 Jan;86(1):1-7. [PubMed](#)

Chadbunchachai W, Sriwiwat S, Kulleab S, Saranrittichai S, Chumsri J, Jaikwang P. The comparative study for quality of trauma treatment before and after the revision of trauma audit filter, Khon Kaen hospital 1998. *J Med Assoc Thai*. 2001 Jun;84(6):782-90. [PubMed](#)

Copes WS, Staz CF, Konvolinka CW, Sacco WJ. American College of Surgeons audit filters: associations with patient outcome and resource utilization. *J Trauma*. 1995 Mar;38(3):432-8. [PubMed](#)

Miller PR, Johnson JC, Karchmer T, Hoth JJ, Meredith JW, Chang MC. National nosocomial infection surveillance system: from benchmark to bedside in trauma patients. *J Trauma*. 2006 Jan;60(1):98-103. [PubMed](#)

Nayduch D, Moylan J, Snyder BL, Andrews L, Rutledge R, Cunningham P. American College of Surgeons trauma quality indicators: an analysis of outcome in a statewide trauma registry. *J Trauma*. 1994 Oct;37(4):565-73; discussion 573-5. [PubMed](#)

Schwartz ML, Sharkey PW, Andersen JA. Quality assurance for patients with head injuries admitted to a regional trauma unit. *J Trauma*. 1991 Jul;31(7):962-7. [PubMed](#)

Shafi S, Barnes S, Nicewander D, Ballard D, Nathens AB, Ingraham AM, Hemmila M, Goble S, Neal M, Pasquale M, Fildes JJ, Gentilello LM. Health care reform at trauma centers--mortality, complications, and length of stay. *J Trauma*. 2010 Dec;69(6):1367-71. [PubMed](#)

Extent of Measure Testing

Using a modification of the RAND/University of California, Los Angeles (UCLA) Appropriateness Methodology, a panel of 19 injury and quality of care experts serially rated and revised quality indicators identified from a systematic review of the literature and international audit of trauma center quality improvement practices. The quality indicators developed by the panel were sent to 133 verified trauma centers in the United States, Canada, Australia, and New Zealand for evaluation.

A total of 84 quality indicators were rated and revised by the expert panel over 4 rounds of review producing 31 quality indicators of structure (n=5), process (n=21), and outcome (n=5), designed to assess the safety (n=8), effectiveness (n=17), efficiency (n=6), timeliness (n=16), equity (n=2), and patient-centeredness (n=1) of injury care spanning prehospital (n=8), hospital (n=19), and posthospital (n=2) care and secondary injury prevention (n=1). A total of 101 trauma centers (76% response rate) rated the indicators (1=strong disagreement, 9=strong agreement) as targeting important health improvements (median score 9, interquartile range [IQR] 8 to 9), easy to interpret (median score 8, IQR 8 to 9), easy to implement (median score 8, IQR 7 to 8), and globally good indicators (median score 8, IQR 8 to 9).

Thirty-one evidence-informed quality indicators of adult injury care were developed, shown to have content validity, and can be used as performance measures to guide injury care quality improvement practices.

Trauma centers rated the indicator "percentage of discharges of patients age 18 years and older with a primary injury diagnosis and one of the following secondary diagnoses: decubitus ulcer, hospital acquired infection, iatrogenic pneumothorax, foreign body left during procedure, myocardial infarction, acute renal failure" as targeting important health improvements (median score 9, IQR 8 to 9), easy to interpret (median score 7.5, IQR 6 to 9), easy to implement (median score 8, IQR 6 to 9), and globally a good indicator (median score 8, IQR 7 to 9).

Evidence for Extent of Measure Testing

Santana MJ, Stelfox HT, Trauma Quality Indicator Consensus Panel. Development and evaluation of evidence-informed quality indicators for adult injury care. *Ann Surg*. 2014 Jan;259(1):186-92. [35 references] [PubMed](#)

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Hospital Inpatient

Intensive Care Units

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Single Health Care Delivery or Public Health Organizations

Statement of Acceptable Minimum Sample Size

Unspecified

Target Population Age

Age greater than or equal to 18 years

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Aim

Better Care

National Quality Strategy Priority

Prevention and Treatment of Leading Causes of Mortality

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Data Collection for the Measure

Case Finding Period

Unspecified

Denominator Sampling Frame

Patients associated with provider

Denominator (Index) Event or Characteristic

Clinical Condition

Institutionalization

Patient/Individual (Consumer) Characteristic

Denominator Inclusions/Exclusions

Inclusions

All discharges of patients age 18 years and older with a primary injury diagnosis

Exclusions

Unspecified

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions

All discharges of patients age 18 years and older with a primary injury diagnosis AND one of the following secondary diagnoses:

- Decubitus ulcer

- Hospital acquired infection (any – pneumonia, blood stream, wound, etc.)

- Iatrogenic pneumothorax

- Foreign body left during procedure

- Myocardial infarction

- Acute renal failure

Exclusions

Unspecified

Numerator Search Strategy

Institutionalization

Data Source

Administrative clinical data

Registry data

Type of Health State

Adverse Health State

Instruments Used and/or Associated with the Measure

Unspecified

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Rate/Proportion

Interpretation of Score

Desired value is a lower score

Allowance for Patient or Population Factors

not defined yet

Description of Allowance for Patient or Population Factors

Risk Adjustment: Age, sex, pre-existing conditions and a validated Injury Severity Score (ISS) (e.g., abbreviated ISS [AIS] or International, Classification of Disease-based ISS [ICISS])

How to calculate Risk-adjusted Adverse Event Rate:

$$\text{Risk-adjusted Adverse Event Rate} = [\text{Observed Adverse Event Rate} / \text{Risk-adjusted Expected Adverse Event Rate (x100)}] \times \text{Overall Adverse Event Rate in the standard population.}$$

Alternatively Risk-adjusted Adverse Event rates can be calculated directly from parameter estimates from a multivariable risk-adjusted model examining data from individual institutions or from multiple institutions.

Note: Standard population refers to a population of institutions under evaluation (e.g., institutions contributing data to a national trauma registry or centrally collected administrative data bank).

Standard of Comparison

not defined yet

Identifying Information

Original Title

Adverse event rate.

Measure Collection Name

Quality Indicators in Adult Trauma Care

Measure Set Name

Hospital Indicators

Submitter

Quality of Trauma in Adult Care (QTAC) Team, University of Calgary - Academic Institution

Developer

Quality of Trauma in Adult Care (QTAC) Team, University of Calgary - Academic Institution

Funding Source(s)

The project was supported by a Partnerships in Health System Improvement Grant (PHE-91429) from the Canadian Institutes of Health Research and Alberta Innovates Health Solutions. Funding sources had no role in the design, conduct, or reporting of this study.

Composition of the Group that Developed the Measure

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- Diane Lorenzetti, Library Science, University of Calgary
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- Colleen M. Sharp, Research Assistant, University of Calgary

Expert Panel

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- Dr. Chad G. Ball, Fellowship in Trauma, Critical Care and Hepatobiliary Surgery, Calgary
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Financial Disclosures/Other Potential Conflicts of Interest

The project was supported by a Partnerships in Health System Improvement Grant (PHE-91429) from the Canadian Institutes of Health Research and Alberta Innovates Health Solutions. Dr Stelfox was supported by a New Investigator Award from the Canadian Institutes of Health Research and a Population Health Investigator Award from Alberta Innovates Health Solutions. Funding sources had no role in the design, conduct, or reporting of this study. The authors declare no conflicts of interest.

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2013 Jan

Measure Maintenance

Unspecified

Date of Next Anticipated Revision

Unspecified

Measure Status

This is the current release of the measure.

Measure Availability

Source available from the [Quality of Trauma in Adult Care \(QTAC\) Web site](#) .

This work is also available from the [Annals of Surgery Web site](#) : Santana MJ, Stelfox HT, Trauma Quality Indicator Consensus Panel. Development and evaluation of evidence-informed quality indicators for adult injury care. Ann Surg. 2014 Jan;259(1):186-92.

For more information, contact QTAC at the University of Calgary, Teaching Research & Wellness (TRW) Building, 3rd Floor, 3280 Hospital Drive NW, Calgary, AB, Canada, T2N 4Z6; Phone: 403-944-2334; Fax: 403-283-9994; E-mail: qtac@qualitytraumacare.com; Web site: www.qualitytraumacare.com

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NQMC Status

This NQMC summary was completed by ECRI Institute on May 11, 2015. The information was verified by the measure developer on July 13, 2015.

Copyright Statement

This NQMC summary is based on the original measure, which is subject to the measure developer's copyright restrictions.

The individual measures from the "Guide to Quality Indicators in Adult Trauma Care," are available from the [Quality of Trauma in Adult Care \(QTAC\) Web site](#) .

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Production

Source(s)

Guide to quality indicators in adult trauma care. Version 3. Calgary (AB): Quality of Trauma in Adult Care, University of Calgary; 2013 Jan 29. 129 p. [111 references]

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